

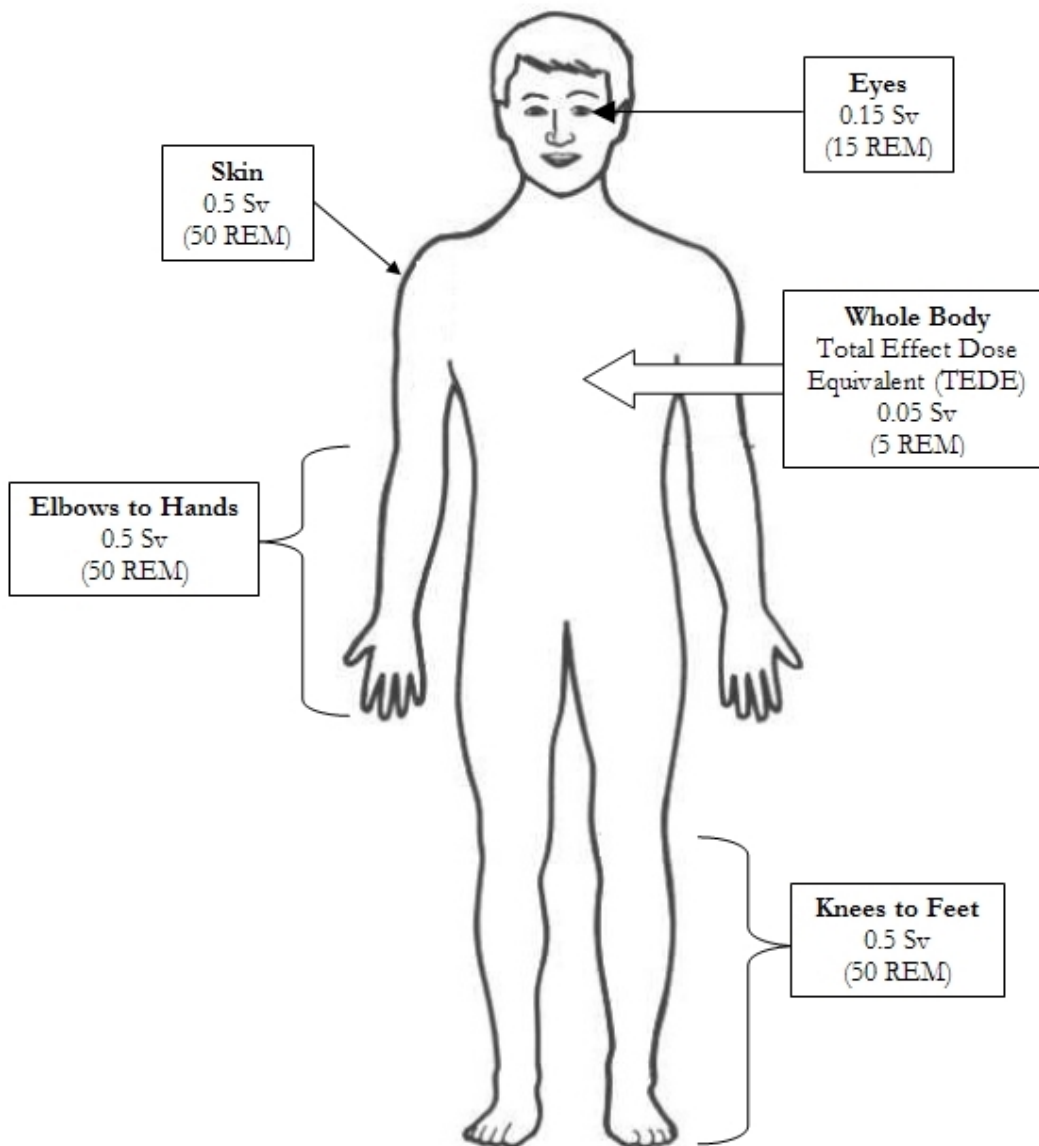
WHO NEEDS TO WEAR A MONITORING BADGE?

State regulations require that licensees provide personal dosimetry badges to adults likely to receive in one year – from sources external to the body – a dose in excess of 10 percent of the applicable limits (see figure below). Dosimetry is also required for minors and declared pregnant women who are likely to receive a dose greater than 10 percent of their respective limits.

Some radiation workers may not have to wear monitoring badges because the potential for significant exposures is very low. In these instances, during the licensing process or before discontinuing existing badge service for these radiation workers, licensees must demonstrate through measurement and/or calculation that worker doses are expected to be less than ten percent of the annual occupational dose limits pictured below.

For example: the annual dose limit for the whole body is 5 rem, which is equivalent to 5000 millirem (mR). Ten percent of 5000 mR is 500 mR. Therefore, if the licensee can demonstrate that the radiation worker will not exceed a whole body dose of 500 mR in one year, the worker is not required to wear a monitoring badge. Instead, the use of a monitoring badge would be considered optional. Even though the radiation workers are not required to wear a badge, they retain the right to request one from the licensee at their own discretion.

ANNUAL DOSE LIMITS FOR RADIATION WORKER



One way to evaluate the average dose received by each individual radiation worker is to have them wear a monitoring badge for a specific period of time (i.e., one year).

The dosimetry reports generated by the badge supplier can then be used to evaluate the worker's expected annual radiation exposure.

Records regarding this worker dose evaluation should be well documented and maintained for inspection by the Department.

If considerable changes occur in the licensee's workload or use of radioactive material, the assessment of the radiation worker's average annual dose must be reevaluated in order to demonstrate compliance.

REGULATIONS FOR MONITORING RADIATION EXPOSURE

North Dakota Radiological Health Rules Subsection 33-10-04.1-09.2, “Conditions Requiring Individual Monitoring of External and Internal Occupational Dose”:

Each licensee or registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the occupational dose limits of this chapter. At a minimum each licensee or registrant shall monitor occupational exposure to radiation from licensed and unlicensed radiation sources under the control of the licensee and shall supply and require the use of individual monitoring devices by:

1. Adults likely to receive, in one year from sources external to the body, a dose in excess of ten percent of the limits in subdivision a of subsection 1 of section 33-10-04.1-06;
 2. Minors likely to receive, in one year from radiation sources external to the body, a deep dose equivalent in excess of one millisievert [100 millirem], a lens dose equivalent in excess of one and five-tenths millisieverts [150 millirem], or a shallow dose equivalent to the skin of the whole body or to the skin of any extremity in excess of five millisieverts [500 millirem] (the assigned shallow dose equivalent must be the dose averaged over the contiguous ten square centimeters of skin receiving the highest exposure);
 3. Declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body a deep dose equivalent in excess of one millisievert [100 millirem];
 4. Individuals entering a high or very high radiation area.
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REGULATIONS FOR OCCUPATIONAL DOSE LIMITS

North Dakota Radiological Health Rules Subsection 33-10-04.1-06.1, “Occupational Dose Limits for Adults”:

The licensee or registrant shall control the occupational dose to individual adults, except for planned special exposures pursuant to subsection 6, to the following dose limits:

1. An annual limit, which is the more limiting of:
 - (a) The total effective dose equivalent being equal to five-hundredths sievert [5 rem]; or
 - (b) The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to five-tenths sievert [50 rem].
2. The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are:
 - (a) A lens dose equivalent of fifteen-hundredths sievert [15 rem]; and
 - (b) A shallow dose equivalent of five-tenths sievert [50 rem] to the skin.